SECTION 5.0 IMPLEMENTATION OF PREFERRED ALTERNATIVE

5.1 Implementation of Actions Under the Preferred Alternative

The idea of opportunistic implementation will be important to making the most of the Master Plan. Opportunistic implementation means that projects should be implemented according to the following conditions:

- As the specific project proposals are submitted and approved by the Trustee Council and Alamosa River Foundation,
- As outside project proponents or "passionate advocates" are identified,
- As the appropriate mix of sufficient funding becomes available to complete the project, and
- As a specific project's implementation is required by or coincides with another related project that is being implemented.

It may mean that projects are implemented out of their proposed order. The Trustee Council and Foundation will receive specific project proposals in accordance with the projects described in the finally approved Master Plan preferred alternative, and will approve acceptable proposals and allocate whatever funds are available and appropriate for their implementation.

Master Plan implementation will be managed ultimately by the state and federal Trustee Council, particularly to oversee the expenditure of the NRD settlement funds. However, the Foundation should provide essential local management of Master Plan implementation. The efforts of the Foundation may be spearheaded by the proposed paid watershed coordinator / project manager. The Foundation could take the lead role in coordinating work on multiple projects. The Foundation will also head up many of the funding tasks, and will be in charge of writing grant applications. The state and federal Trustee Council, the Foundation, and stakeholders will meet regularly to coordinate implementation and share knowledge.

Each project should be coordinated by a project manager. The project manager could be either the watershed coordinator, or another party such as a knowledgeable, passionate advocate for the project, a federal or state Trustee, a non-paid Foundation member, or a consultant. For many projects, there is an obvious choice for project manager, an individual or group with a majority stake in the project or direct experience with the type of project. For instance, completion of the project between County Road 10 and Gunbarrel Road would most logically be conducted by Alamosa River Foundation, Black Creek Hydrology, and CWCB, the groups currently undertaking the project.

5.2 Possible Implementation Schedule

Certain projects should be implemented only after the implementation of others has begun. The following projects are best implemented after other projects:

- The trade of direct flow diversion right for reservoir storage and increase spillway capacity projects should not be initiated until there is a willing water right seller. Once there is a seller, these projects should all be coordinated together because the water rights change case will involve changes to the use, place of diversion, and transfer from direct use to storage.
- If more than one water right is transferred, it is recommended that the second transfer does not occur until the first transfer is completed. With the number of uncertainties regarding the

transfers, it would be beneficial to have the experience of the first transfer prior to the second. However, because water rights must be obtained when they become available, purchasing must be done when the opportunity presents itself.

- It is recommended that if after some period of time, such as 5 years, there is no willing water rights seller, the Trustees and Foundation can decide to reallocate those funds to implement another project.
- Bank work between County Road 10 and County Road 13 should not begin until after the upstream stream restoration projects. The upstream projects are likely to change the sediment balance in the river and could change the design necessary for the downstream reaches.

It is recommended that the stream restoration work between Gunbarrel Road and County Road 10 be completed as soon as possible. Completing the stream restoration upstream of Gunbarrel Road should occur soon after. Stabilizing banks upstream of Gunbarrel Road will be important to maintain the benefits of the project between Gunbarrel Road and County Road 10.

Some of the restoration projects will occur on an ongoing basis. This includes the work of the Foundation and obtaining easements. The Foundation should be funded immediately to begin work on implementing the Master Plan. Easements can be obtained only when a willing landowner comes forward and can be established at any time if funds are available to complete the transaction.

Table 5-1 summarizes one logical option for project sequencing and duration for the preferred alternative. The duration of design and implementation is listed in the table. Project phasing allows for more even distribution of cash flow. **Figure 5-1** shows one possible implementation schedule. As noted above, many factors will influence the actual order that projects are implemented. The Trustees and stakeholders will chose to implement projects in an order that is appropriate for available funding and based other factors. The actual order may be different from that shown below.

Table 5-1. Possible Project Sequencing and Duration of Preferred Alternative

Project Number	Project	Predecessor Projects	Start Date	Approximate Duration (Years)
44	Funding for Alamosa River Foundation to help implement and monitor the master plan	---	Mar 2005	10
3	Funding to complete ongoing streambank project between Gunbarrel Road and County Road 10	---	Jun 2005	1
1	Stream restoration from Wightman Fork to Terrace Reservoir; dead tree management in upper watershed	---	Jun 2005	2
31	Riparian Buffer Zone	---	Jan 2006	3
38	Recreation/access/conservation easements	---	Jan 2006	10
9a	Purchase 1st round of water rights for instream flow	---	Jan 2006	4
2	Stream restoration from Gomez Bridge to Gunbarrel Road; Revegetation, dead tree management, noxious weed management, and grazing management in lower watershed	---	Jun 2006	2
23	Reclamation of abandoned mines (Pass-Me-By mine only)	---	Jun 2006	2
22	Sediment trap pilot project with water quality best management practices on Alum Creek	---	Jun 2007	4
20	Lower watershed sediment deposition locations combined with stream restoration from County Road 10 to County Road 13	2, 3	Jun 2008	2
12	Trade of direct flow diversion right for storage of instream flow water rights in Terrace Reservoir (no new water source)	9a	Jan 2009	2
9b	Second round of water rights for instream flow	9a	Jan 2009	3
41	Increased access to Terrace Reservoir		Jan 2010	2
24	Small mainstem lake for water quality	---	Jan 2011	5
15	Increase Terrace Reservoir spillway capacity to remove storage restriction (in return for instream flow storage); PMF Study	9a & 9b	Jan 2012	4

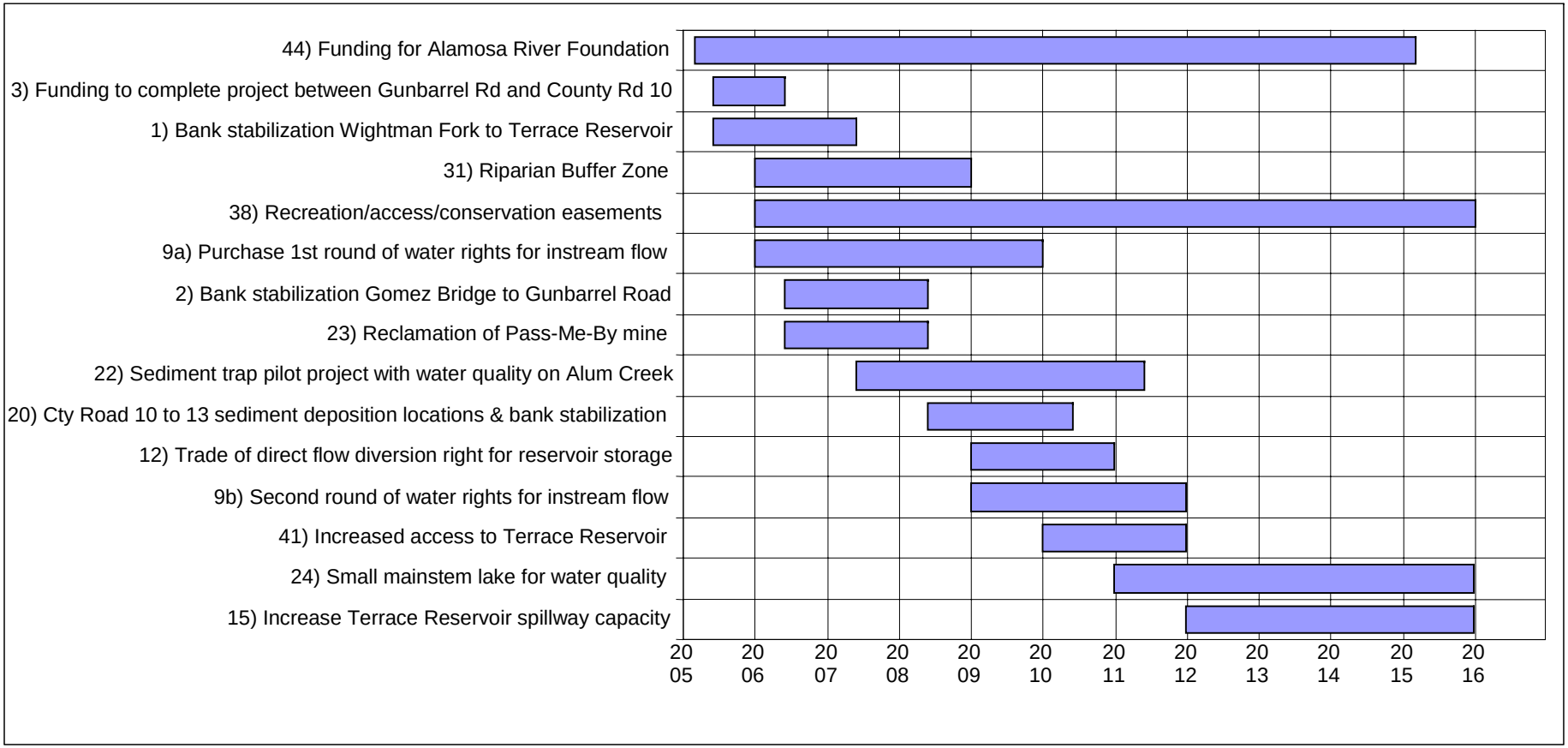

Figure 5-1. Possible Implementation Sequence of Preferred Alternative

Note: this chart represents one possible sequence of projects. Actual project sequencing may be different

5.2.1 Options for Variation

There are several options for variation in the project implementation schedule. Also, it is important to keep in mind that projects should be attempted on an opportunistic basis. Projects that are particularly flexible are those without predecessors listed in **Table 5-1**. Projects that are independent of other projects and can be implemented at any time are:

- Small mainstem lake for water quality
- Reclamation of Pass-Me-By mine
- Sediment trap pilot project with water quality on Alum Creek
- Easements
- Riparian buffer zone

It is conceivable that one or more of the suggested restoration projects will not be feasible to implement. If this occurs, the Master Plan should be implemented without the project. However, all projects dependent on the missing project must also be neglected, unless a replacement project is found. Two such scenarios are discussed below:

Trade of Direct Flow Diversion Right for Reservoir Storage Infeasible Scenario

If water rights are acquired but the trade of direct flow for reservoir storage project is not possible, other storage options can be pursued. Buying storage in Terrace Reservoir and changing the flow right to a storage right is a more conventional approach that may move through water court more easily. Another option would be to further investigate aquifer storage of the water right using an augmentation plan (as discussed in Section 3). A groundwater augmentation plan may allow the entire historical water right, not just the consumptive use, to be recharged to the groundwater and then a portion of that water could be pumped out for instream use.

Instream Flow Project Infeasible Scenario

If a water right cannot be acquired, the following projects will need to be removed from the implementation schedule, or modified:

- Instream flow storage projects including increase capacity of Terrace Reservoir Spillway
- Easements in the lower watershed
- Revegetation downstream of Terrace Reservoir may have to be scaled back based on less water in the stream and potentially decreased groundwater levels. The design of revegetation projects must consider the amount of water available.

There is no substitute project to provide the benefits of instream flow in the lower watershed if this project is not implemented.

Mainstem Lake Infeasible Scenario

If the mainstem lake project is infeasible, there are not any projects that need to be removed from the Master Plan. If this project is not constructed but funding is available, other proposed water quality projects could be implemented or expanded. Funds could be used to do additional sediment trap projects at tributary confluences, passive lime addition, or reclaim additional abandoned mines.

5.3 Funding Opportunities

Natural Resource Damage (NRD) funds and other sources of funding are discussed below.

5.3.1 NRD Funding

The NRD funds are a major source of funding for those projects that fit the NRD requirements. The NRD funds from the Summitville settlement totals $5 million, but can only be used for projects meeting the NRD criteria. As stated in **Section 1**, NRD-funded projects are intended to restore, rehabilitate, replace, or acquire the equivalent of natural resources that have been injured or lost as a result of releases of hazardous substances at the Summitville site. The Trustees reviewed the proposed projects and determined which projects would be eligible for NRD funds. Those determinations are summarized in **Table 5-3**.

Table 5-3. Project Potential for NRD Funding

#	Project Description	Potential for NRD Funding	Potential for Other Funding
1	Stream restoration Terrace Reservoir to Wightman Fork	x	x
2	Stream restoration Gomez Bridge to Gunbarrel Road	x	x
3	Funding to complete project between Gunbarrel Rd and County Rd 10	x	x
4	Stream restoration County Rd 10 to County Rd 13	x	?
5	Dead Tree Management Upstream of Terrace Reservoir	?	
6	Dead Tree Management Downstream of Terrace Reservoir	?	x
7	Modify Land Use Regulations for Flood Control		x
8	Setback Levees at Capulin for Flood Control		x
9	Purchase appropriate water rights for instream flow	x	x
10	Controlled Releases from Terrace Reservoir with Supplemental Water Source	x	x
11	Aquifer storage for instream flow	x	x
12	Trade of direct flow diversion right for reservoir storage (no new source)	x	x
13	New reservoir to store instream flow	x	x
14	New reservoir to store existing agriculture water rights		?
15	Increase spillway capacity	?	x
16	Raise crest of dam	?	x
17	Sediment removal to increase capacity	?	x
18	Improve outlet works (tower)	x	x
19	Power generation at Terrace Reservoir		x
20	Lower watershed sediment deposition locations		?
21	Road management in upper watershed	x	x
22	Sediment traps at tributary confluences	x	?
23	Reclamation of abandoned mines	x	x
24	Mainstem lake or reservoir below Wightman Fork	x	x
25	Sulfate reducing wetland on Wightman Fork or other tributaries	x	x
26	Active water quality improvement on tributaries upstream of Wightman Fork	x	x
27	Noxious weed management in the upper watershed	?	x
28	Noxious weed management in the lower watershed	?	x
29	Revegetation in the lower watershed	x	x
30	Grazing management	x	x
31	Riparian Buffer Zone	x	x
32	Acquisition of equivalent resource in San Luis Valley for high quality habitat and recreation	x	x
33	Purchase land DS of Wightman Fork for recreation and habitat	x	x
34	Fish-stocking above Terrace	x	x
35	Fish-stocking at Terrace	x	x
36	Fish-stocking below Terrace	x	x
37	Construction of fish barriers	x	x
38	Establishing conservation easements	x	x
39	Ditch headgate consolidation		x
40	Replace headgates with corrosion resistant materials		?

#	Project Description	Potential for NRD Funding	Potential for Other Funding
41	Improve public access to Terrace Reservoir	x	x
42	Improved access to main stem of the river above Terrace	x	
43	Improved access to main stem of the river below Terrace	x	x
44	Funding for citizen group to help implement and monitor the Master Plan	x	x
45	Site specific PMF study	?	x
46	Ice Jam Flooding Study	x	?
47	Capulin Flood Hazard Mitigation Plan		x
48	Dewatering Management Plan		x
49	Terrace Reservoir sediment quality study	?	x
50	Ground water monitoring		x

x = yes, ? = maybe, blank = no

Most of the projects included in the Preferred Alternative have potential for NRD funding. The Preferred Alternative projects for which eligibility for NRD funding is questionable are:

- Dead tree management, Projects 5 and 6
- Increase Terrace Reservoir spillway capacity, 15
- Site-specific probable maximum flood study, Project 45
- Noxious weed management, Projects 27 and 28

The only project from the Preferred Alternative that clearly does not have potential for NRD funding is lower watershed sediment deposition locations, Project 20.

Each of the questionable or no-potential projects is included in the Preferred Alternative to complement a project that does have potential for NRD funding. For instance, dead tree management and noxious weed management are combined with stream restoration projects to improve the effectiveness of each of the projects. Increasing the spillway capacity and doing the site-specific probable maximum flood study are only included to provide storage for the instream flow water rights. Because the questionable projects are included as a benefit to projects with NRD funding potential, a case could be made for each of them to meet the requirements of NRD funding. However, with the available NRD funds being only 1/3 of the total estimated costs of the preferred projects, the use of the NRD funds will be focused on those projects most in keeping with the NRD restoration goals identified at the beginning of this section.

5.3.2 Other Sources of Funding

Other sources of funding are available for watershed restoration projects that do not necessarily qualify for NRD funding. Potential national funding sources are summarized in **Table 5-4** and potential state and local funding sources are summarized in **Table 5-5**. It is critical to leverage the NRD funding with matching funds such as those described below in order to maximize benefits to the Alamosa River Watershed.

Table 5-4. Summary of Potential National Funding Sources

Source	Fund/Program Name	Monetary Range	Requirements
US Army Corps of Engineers	N/A	N/A	Flood control and environmental restoration projects that meet certain benefit/cost and national economic development criteria.
US Army Corps of Engineers	Restoration of Abandoned Mine Sites (RAMS)	N/A	Restoration of abandoned non-coal mines.
American Sportfishing Association	FishAmerica Foundation	$5,000 - $50,000	Citizen-driven riparian habitat restoration projects for habitat important to anadromous fish species
USDA and Natural Resources Conservation Service (NRCS)	Integrated Research, Education, and Extension Competitive Grants	N/A	Projects that evaluate the effectiveness of conservation practices for achieving locally defined water quality goals
USDA and NRCS	Farm and Ranch Land Protection Program	N/A	Matching funds to help purchase development rights to keep productive farm and ranchland in agricultural uses
USDA and NRCS	Conservation Reserve Program	About $30 per acre annually	10-15 year contracts for land owners and operators to convert highly erodible and other environmentally sensitive cropland to vegetative cover such as introduced and native grasses, wildlife habitat and food plot plantings, trees, filter strips, or riparian buffers.
USDA and NRCS	Environmental Quality Incentives Program	$10,000 per year and $50,000 over contract life	Technical, financial, and educational assistance to farms and ranchers to address significant natural resource concerns. Conservation practices includes grassed waterways, filter strips, manure management facilities, and protecting wildlife habitat.
USDA and NRCS	Resource Conservation and Development (RC&D)	N/A	RC&D areas promote conservation development and use of natural resources, improve the general level of economic activities, and enhance the environment and standard of living in communities. The San Luis Valley RC&D formed the San Luis Valley Environmental Conservation Education Council to provide environmental conservation education to youth.
USDA and NRCS	Small Watershed Program	N/A	Projects include watershed protection, flood prevention, erosion and sediment control, water supply, water quality, fish and wildlife habitat enhancement, wetlands creation and restoration, and public recreation in watersheds of 250,000 or fewer acres. Both technical and financial assistance are available.
USDA and NRCS	Wetlands Reserve Program, Wildlife Habitat Incentive Program, Grassland Reserve Program	N/A	Programs aimed at restoring and protecting wetlands, grasslands, and habitat.
US Fish and Wildlife Service	Partners for Fish and Wildlife	N/A	Funding and technical assistance for habitat improvement projects to private landowners.
Patagonia	Environmental Grants	$3,000 - $8,000	Priorities are biodiversity, forests, media/publications, resource extraction, social activism, sustainable agriculture, and water/marine protection.

Table 5-4 (Continued)

USEPA	Regional Geographic Initiative Program	N/A	Funds for unique, geographically-based projects that fill critical gaps in the Agency's ability to protect human health and the environment. Funds are available through EPA regional offices.
USEPA	Assessment and Watershed Protection Program Grants	N/A	Supporting a watershed approach to better address water quality problems
Department of Homeland Security	N/A	N/A	Reservoir Improvements
National Research Initiative	Enhancing the Prosperity of Small Farms and Rural Agricultural Communities Competitive Grants	Up to $500,000	Projects that develop and test hypotheses to improve understanding of economic, social, biological, and environmental components important to small farms and rural economic development.
National Fish and Wildlife Foundation	Pulling Together Initiative Grant Program	N/A	Modest grants to support the creation of cooperative Weed Management Area partnerships.
National Geographic Society	Conservation Trust Grants	Roughly $15,000 to $20,000	Projects that contribute significantly to the preservation and sustainable use of biological, cultural, and historical resources, especially cutting edge programs that may be overlooked by other funding sources.
River Network	Watershed Assistance Grants	$1,500 to $30,000	Seed money to initiate grass-roots watershed protection groups. Projects have included development of GIS databases, funding for meetings/conferences, hire coordinators, and conduct studies. Grants cannot be used for on-the-ground restoration projects.
Bureau of Land Management / Forest Service	N/A	N/A	Funds to remediate abandoned mines on federal lands.

Table 5-5. Summary of Potential State and Local Funding Sources

Source	Fund/Program Name	Monetary Range	Requirements
CWCB / Dept. of Natural Resources	N/A	N/A	Flood hazard mitigation plans, floodplain mapping projects, restoration projects, erosion control projects
CWCB	Construction Loan Program	N/A	Low interest loans for water resources projects
Colorado Division of Wildlife	Cooperative Habitat Improvement Program	N/A	Cost-sharing program for landowners interested in improving or developing wildlife habitat.
Colorado Division of Wildlife	Habitat Partnership Program	N/A	Improve habitat for big game animals and alleviate rangeland forage and fence conflicts with big game animals
Colorado Division of Wildlife	Colorado Waterfowl Stamp Program	N/A	Matching funds to private landowners interested in developing projects that provide benefits to waterfowl and wetlands habitat
Colorado Division of Wildlife	Colorado Wetland Initiative Legacy Project	N/A	Conserves biologically significant wetlands in Colorado
Colorado Division of Wildlife	Colorado State Trust Lands	N/A	Money for habitat management projects on private properties with high wildlife recreational uses such as hunting. Projects may include creation of small impoundments, fencing riparian corridors, and vegetative habitat plantings.
CDPHE	Clean Water Act Section 319 Non-point Source Grants	$2 million total for 2005	Funds from EPA to reduce non-point source pollution for activities such as groundwater protection and abandoned mine cleanup. Funds can also be used to monitor 303(d) listed waters. Must have watershed-based plan for funding construction projects.
Colorado State Lottery	Great Outdoors Colorado Trust Fund	$10,000 to $2,000,000	Grants for recreation, wildlife and open space. Grants are typically awarded to Colorado State Parks, Division of Wildlife, Local Governments, and non-profit land conservation organizations.
San Luis Valley Wetland Focus Area Committee	N/A	N/A	Local link to national funding organizations interested in supporting wetland preservation and enhancement projects.
Rio Grande Headwaters Land Trust	N/A	N/A	Provides financial incentives to establish conservation easements and preserve lands for agricultural use in the Rio Grande basin.

5.4 Implementation Steps

The Trustees will periodically announce a request for proposals (RFP) for restoration projects that qualify for NRD funds. Proposals will be considered from the general public, governmental agencies, members of the General Assembly, community groups, and private entities. The Trustees' project selection criteria are similar to the project evaluation criteria discussed in **Section 3.3**. The Trustees' screening and ranking criteria for awarding NRD funding are summarized in **Table 5-6**.

Table 5-6. Trustees' Selection Criteria for Potential NRD-funded Projects

Screening Criteria
Compliance with laws
Public health and safety
Relationship to injured natural resources and services (includes surface water, groundwater, geologic resources, and biological resources)
Technical feasibility
Cost effectiveness (compared to other activities with similar benefits)
Consistency with the Trustee's restoration goals
Opportunities for collaboration

Ranking Criteria
Public acceptance
Likelihood of adverse impacts
Likelihood of success
Multiple natural resource benefits
Time to provide benefits
Duration of benefits
Importance of NRDA funding to success of the project
Protection of implemented project (such as easement or land acquisition)
Project cost
Project consistency with regional planning
Public access and benefit

For projects that do not qualify for NRD funding, a proposal (e.g. grant application) would still be needed for other funding sources. A project sponsor may incur substantial cost in order to prepare a proposal due to the background work necessary to complete an adequate proposal. Many of the projects will require additional research and field work.

Table 5-7 lists some of the steps that will be required for each project to be selected for funding and to complete the project.

Table 5-7. Implementation Steps for Each Project in Preferred Alternative

Project	Implementation Steps
Funding for Alamosa River Foundation to help implement and monitor the Master Plan	• Develop a budget • Foundation submits proposal for funding • Hire a director • Establish policies and procedures
Funding to complete ongoing stream restoration project between Gunbarrel Road and County Road 10	• Identify needed changes to original design • Develop budget and schedule for remaining work • Project sponsor submits proposal to complete project between County Road 10 and Gunbarrel Road. • Complete construction
Stream restoration from Wightman Fork to Terrace Reservoir; dead tree management in upper watershed	• Perform detailed streambank assessment and prioritize problem areas • Identify any dead trees to be removed from channel or banks • Create budget and schedule • Project sponsor submits proposal with conceptual design for stream restoration • Complete engineering design • Complete construction
Riparian Buffer Zone	• Make contacts with major landowners to determine level of support and preferences for buffer zone • Develop general criteria for the buffer zone such as width, allowed activities and prohibited activities • Make contacts with local governments to determine level of support for projects and process for establishing regulations • Create budget and schedule • Project sponsor submits proposal including plan for creating buffer zone • Plan is implemented
Recreation/access/conservation easements	• Prioritize locations for each type of easement • Initial discussions with property owners to gage level of interest • Real estate analysis to estimate cost per acre • Create budget and schedule • Project sponsor submits proposal including plan for obtaining and managing easements • Plan is implemented
Purchase water rights for instream flow	• Determine if there are any willing sellers • Examine historical usage including quantity and type of crop • If land is to be sold, determine a management approach for the land • Determine storage location for the water right • Create budget and schedule • Project sponsor submits proposal with plan for obtaining and utilizing an identified water right • Plan is implemented
Stream restoration from Gomez Bridge to Gunbarrel Road; Revegetation, dead tree management, noxious weed management, and grazing management in lower watershed	• Evaluate the existing Rosgen conceptual design and determine any necessary changes to that design • Create budget and schedule • Project sponsor submits proposal with conceptual design of stream restoration • Complete engineering design • Complete construction
Reclamation of abandoned mines (Pass-Me-By mine only)	• Determine landowner interest in project • Create budget and schedule • Project sponsor submits proposal with conceptual design of project elements • Complete engineering design • Complete construction

Project	Implementation Steps
Sediment trap pilot project with water quality best management practices on Alum Creek	• Conduct feasibility study/alternatives analysis to determine best construction techniques, materials, and sediment disposal locations • Create budget and schedule • Project sponsor submits proposal including conceptual plan of structural and water quality elements • Complete engineering design • Complete construction • Schedule sediment removal • Evaluate monitoring results and determine if design should be modified
Lower watershed sediment deposition locations combined with stream restoration from County Road 10 to County Road 13	• Perform detailed channel assessment and determine problem areas • Prepare conceptual design • Create budget and schedule • Project sponsor submits proposal • Complete engineering design • Complete construction
Trade of direct flow diversion right for storage of instream flow water rights in Terrace Reservoir (no new water source)	• Determine Terrace Irrigation Company interest and preferences • Determine legal requirements of project • Create budget and schedule • Project sponsor creates plan for implementing project • Project sponsor submits proposal for project
Increased access to Terrace Reservoir	• Determine Terrace Irrigation Company, Forest Service, and watershed residents' preferences for project • Prepare site plan • Create budget and schedule • Project sponsor submits proposal • Complete engineering design • Complete construction
Small mainstem lake for water quality	• Determine Forest Service requirements for project • Determine legal and permitting requirements for project • Conduct alternative feasibility study • Prepare conceptual design for selected alternative • Create budget and schedule • Project sponsor submits proposal • Complete engineering design • Complete construction
Increase Terrace Reservoir spillway capacity to remove storage restriction (in return for instream flow storage); PMF Study	• Project sponsor submits proposal for feasibility study • Conduct initial geotechnical and site assessments • Conduct PMF study • Complete feasibility study to determine most efficient method to increase spillway capacity and estimate cost • Project sponsor submits proposal for design and construction • Complete engineering design • Complete construction

Note: all projects must be monitored for effectiveness after implementation

5.5 Monitoring Plan

Monitoring plans will be developed and included in each specific project proposal. Monitoring activities will be different depending on the type of project as described below. The Trustee Council and Foundation will monitor project results. In many cases volunteers can be mobilized from the local community (e.g., students, environmental groups) to perform monitoring tasks. Volunteers can be trained and can work in teams with subject matter experts. However, volunteers should only be used when appropriate given their experience and availability.

5.5.1 Reporting Responsibilities of the Alamosa River Foundation

The Alamosa River Foundation should report on the progress of the Master Plan with a written report on an annual basis. Reporting parameters should include:

- Statement of income and expenditures
- Grant applications completed
- Description of projects implemented
- Description of monitoring plans and summary of results
- Statement of plans for the next year

This annual report is expected to be undertaken by the Foundation as part of their regular duties and will not require the purchase of additional equipment. The report could be posted to the Foundation's website and posted in public locations at minimal cost.

Additionally, the Foundation should schedule a mid-year meeting or conference call with the Trustee Council to report on progress.

5.5.2 Stream Restoration Monitoring

Stream restoration project success, comparing conditions prior to the project, during implementation, and after project completion, can be monitored using established reference cross sections. The cross sections can be evaluated periodically using surveys, photo records, and aerial photos. Cross section spacing is dependent on specific characteristics of the reference reach, and would vary from 1,000 to 5,000 feet.

5.5.3 Vegetation Monitoring

The status of revegetation areas and the riparian zone can be monitored by comparing conditions prior to the project, during implementation, and after project completion. A combination of the following methods can be used:

- Photograph documentation of the present condition of the existing environment. Photographs will be taken from established locations on a yearly basis for monitoring purposes. Fixed point photograph stations would be established in restoration/enhancement areas as well as in reference, or baseline, locations for comparison.
- Monitoring of randomly placed transects established within or across the river corridor, as appropriate to provide an accurate representation of riparian zones. Transects would be permanently established in revegatation/enhancement areas as well as in reference, or baseline, locations for comparison. The start and end points of the transects would be staked in the field and mapped using a global positioning system (GPS) unit so that they can be repeated. Along each transect, quadrats would be placed at suitable intervals. Vegetation analysis, including species composition and percent areal cover by species and stratum, would be surveyed within

each quadrat. Species composition is calculated by identifying all species within a quadrat, then categorizing them as desirable versus undesirable. Percent areal cover is calculated by individual species within each vegetative stratum (i.e. tree layer, shrub layer, herbaceous/grass layer). This data would provide information on nuisance/noxious weeds as well.

- Surveying plantings for survivability. Plantings will be inventoried, then surveyed after an established period of time to track survival. The inventory would determine individual species survival, and overall survival of plantings.

A specific plan would be necessary for each individual revegetation project.

5.5.4 Water Quality Monitoring

The approach to water quality monitoring should balance the needs of data gathering with cost. Any best management practice (BMP) implemented in the watershed should be monitored for effectiveness. BMP monitoring usually includes water quality sampling of the inflow and outflow of the structure.

Due to their experimental nature, pilot projects should be monitored more extensively than abandoned mine reclamation projects, which are likely to follow well-documented procedures.

The most important water quality parameters in the Alamosa River are metals and pH. Metals analysis is labor intensive and lab cost intensive, whereas, pH can be measured continuously using a meter or can be measured using low-cost methods. Conductivity and pH meters are often installed concurrently. Conductivity is directly related to dissolved metals concentration and can be used as an indication of changes in dissolved metals. It is recommended that both the sediment trap pilot project and mainstem lake project be implemented with a continuous pH meter immediately upstream and downstream to measure the effectiveness of the project. If funds are available, conductivity meters should also be installed. Both projects should also utilize periodic metals analysis to directly determine their effectiveness in removing metals.

Data collected by CDPHE as part of the Summitville project should be used whenever possible to compare conditions before, during, and after implementation of restoration projects. However, it will be important to isolate changes due to restoration projects from changes due to progress at the Summitville site as well as natural variation in water quality.

5.5.5 Water Quantity Monitoring

The success of the instream flow project can be monitored through the following activities:

- Division of Water Resources diversion records
- Stream gage records for the “Alamosa River Below Terrace Reservoir” gage
- Periodic analysis of stream stage at selected locations such as Gunbarrel Road and County Road 10 in the lower Alamosa River to estimate streamflow.

These activities can be completed at minimal cost. Trained volunteers may be capable of doing some of the monitoring tasks such as summarizing diversion and stream gage records, surveying the stream stage, and estimating streamflow.

5.5.6 Recreation Monitoring

Recreation can be challenging to monitor. A typical way to monitor recreation is to track user-days at campgrounds and facilities, such as the proposed new facilities at Terrace Reservoir.

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